Claims 1, 3, 7-9, and 17 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Fuller et al. (U.S. Patent No. 5,771,301, hereinafter Fuller). Claims 4-6, 11-16, and 19-21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fuller, and claim 10 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Fuller in view of Dasilva (U.S. Patent No. 54,654,610). These rejections are respectfully traversed.

At page 2 of the Office Action, the Office Action asserts that Fuller discloses a sound control system comprising first circuitry 204, attenuator 206, second circuitry (amplifier 242) which receives a control signal from volume control 212, and feedback circuitry including signal AC to DC converter and level shifter 208 and comparator 210. The Office Action further asserts that at column 8, lines 12-50, Fuller discloses that AC to DC converter and level shifter 208 rectifies the signal from the attenuator 206, and that the comparator 210 compares the rectified signal 232 with the reference signal 234 to determine the gain control signal 226 applied to the attenuator 206. The Office Action contends that the AC to DC converter and level shifter 208 "inherently determines a Root Mean Square value" of a second audio signal (i.e., the signals on line 228 and 230 in Fig. 4 of Fuller) as recited in each of Applicant's independent claims 1 and 17.

1. The Rejection of Claims 1 and 17 Based on Inherency

As stated in the Manual of Patent Examining Procedure (MPEP), "[i]n relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic <u>necessarily</u> flows from the teachings of the applied prior art. (MPEP §2112, page 2100-52, Original Eighth Ed., Aug. 2001, emphasis in original.) Specifically, "'[t]o establish inherency, the intrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" (Id., page 2100-51.)

In the present situation, not only does Fuller not disclose, teach, or suggest that the AC to DC converter and level shifter 208 determines a Root Mean Square value of either of the audio

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signals on lines 228 and 230 in Fig. 4 of Fuller, but Fuller explicitly discloses that it does not. Specifically, in column 8, Fuller discloses that the "two signal channels on lines 228 and 230 are "rectified," summed, and filtered" by the AC to DC converter and level shifter 208 "to produce a single DC control signal that represents the phase independent sum of the two channels in line 232." (Col. 8, lines 17-20.)

As well known to those of ordinary skill in the art, and as illustrated by the enclosed definition, the root-mean-square (rms) amplitude of a waveform is "the square root of the time average value of the square of a waveform." (Electronic Circuits and Applications, page 30, Stephen D. Senturia and Bruce D. Wedlock, ISBN 0-471-77630-0.) Because the disclosed steps of rectifying, summing, and filtering performed by the AC to DC converter and level shifter 208 of Fuller do not literally or inherently determine a Root Mean Square value, the rejection of claims 1 and 17 based thereon should be withdrawn.

2. Each of Claims 1 and 17 Patentably Distinguish Over Fuller

Claim 1 is directed to circuit for processing broadcast signals. The circuit comprises first circuitry for receiving a broadcast signal and processing the broadcast signal to extract and output a first audio signal, an attenuator for receiving the first audio signal and attenuating the first audio signal based upon a first control signal to generate a second audio signal, second circuitry for receiving the second audio signal and one of attenuating and amplifying the second audio signal based upon a second control signal to generate a third audio signal, and feedback circuitry for generating the first control signal based upon the second audio signal. The feedback circuitry includes third circuitry for receiving the second audio signal and determining a Root Mean Square (RMS) value of the second audio signal and providing an output signal based upon the RMS value, and a comparator for receiving the output signal and comparing the output signal with at least one reference signal to generate the first control signal.

As recited in Applicant's claim 1, it is the third circuitry that is to receive the second audio signal, determine a Root Mean Square (RMS) value of the second audio signal, and provide an output signal that is based upon the RMS value to the comparator. Although the Office Action asserts that the AC to DC converter and level shifter 208 of Fuller "inherently

determines a Root Mean Square value" of a second audio signal (i.e., the signals on line 228 and 230 in Fig. 4 of Fuller), Applicant has already demonstrated above that this is not the case, as Fuller explicitly discloses that the AC to DC converter and level shifter 208 produces a single rectified, summed, a filtered DC control signal 232. Further, although Fuller discloses that an auto-level amplifiers and threshold integrator circuit 210 receives and uses an average of the time weighted peaks of the signal on line 232, the output signal provided by this circuit is not based upon the RMS value of the second audio signal. Indeed, even if this "average of the time weighted peaks" were an RMS value, which it is not, the output signal of the circuit 210 is not provided to a comparator as recited in Applicant's claim 1. Instead, the output signal of circuit 210 is provided to a display and reference circuit 214. Accordingly, because claim 1 recites limitations that are not literally or inherently disclosed in Fuller, claim 1 patentably distinguishes thereover.

Claims 3-9 and 11-16 depend either directly or indirectly from claim 1 and patentably distinguish over Fuller for at least the same reasons. Although claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Fuller in view of Dasilva, Dasilva fails to disclose, teach, or suggest the above noted limitations of claim 1. Accordingly, claim 10 is also in allowable condition based upon its dependence from claim 1.

Claim 17 is directed to a method for processing broadcast signals. The method comprises steps of receiving a broadcast signal and processing the broadcast signal to extract and output a first audio signal, attenuating the first audio signal to generate a second audio signal based upon a first feedback control signal, and one of attenuating and amplifying the second audio signal based upon a second control signal to generate a third audio signal. The step of attenuating the first audio signal includes determining a Root Mean Square (RMS) value of the second audio signal and providing an output signal that is based upon the RMS value, and comparing the output signal with at least one reference signal to generate the first feedback control signal.

Claim 17 recites that the step of attenuating the first audio signal includes steps of determining a Root Mean Square (RMS) value of the second audio signal and providing an output signal that is based upon the RMS value, and comparing the output signal with at least one reference signal to generate the first feedback control signal. As discussed above with

respect to claim 1, Applicant has already demonstrated that the AC to DC converter and level shifter 208 of Fuller does not "inherently" determine a Root Mean Square value" as asserted in the Office Action. Rather, Fuller explicitly discloses that the AC to DC converter and level shifter 208 produces a single rectified, summed, a filtered DC control signal 232.

Although Fuller discloses at column 8, lines 24-30, that the auto-level amplifiers and threshold integrator circuit 210 "receives and uses the peaks of the signal (i.e., the maximum line inputs) on line 232 from the signal converter 208", and that the "average of the time weighted peaks [of the signal on line 232] are used to determine the amount of gain to be applied by the two channel tracking stereo gain control 206 to the signals received on lines 222 and 224," this average of the time weighted peaks of the signal on line 232 is not a Root Mean Square value, as shown by the enclosed definition.

Furthermore, in Fuller, the average of the time weighted peaks of the signal on line 232 is used to limit the effects of clipping and signal loss in the output signal after large input amplitude changes. (See col. 1, lines 28-33, lines 60-63, and col. 2, lines 25-29, wherein Fuller notes that the "peak limiter circuit is coupled to the integrator circuit to limit the rate of response of the integrator circuit during large changes in the amplitude of the output signal to substantially eliminate the loss of signal or silent periods during the large changes in amplitude of the output signal.") Embodiments of Applicant's invention do not need to solve the problems of signal loss and clipping during large changes in amplitude, because they utilize the Root Mean Square value of the second audio signal to control attenuation, rather than the peaks of a second audio signal (or more specifically, the peaks of a rectified, summed, and filtered set of audio signals) as done in Fuller. Accordingly, because Fuller does not disclose, teach, or suggest a method of processing broadcast signals that includes a step of determining a Root Mean Square (RMS) value as recited in claim 17, claim 17 patentably distinguishes over Fuller.

Claims 19-21 depend from claim 17 and patentably distinguish over Fuller for at least the same reasons.

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner

believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to deposit account No. 23/2825.

Respectfully submitted,

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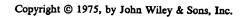Attorney's Docket No.: S1022/8047
Dated: April 22, 2002

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ELECTRONIC CIRCUITS AND APPLICATIONS

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wave. The magnitude of the peak value I_p is called the *amplitude* of the waveform.

The sinusoidal waveform is *periodic*, repeating a basic pattern over and over. In Fig. 2.13b, the time for a full cycle is denoted by T, which is called the *period* of the sine wave. A related concept is the *frequency*, denoted by f, which specifies how many full cycles the waveform goes through in one second. The relationship between frequency and period is

$$f = \frac{1}{T} \tag{2.9}$$

The unit of frequency is the *hertz*, abbreviated Hz (1 Hz = one cycle/second).

An expression that combines the amplitude and frequency information for the current waveform of Fig. 2.13b is

$$i = I_p \sin (2\pi ft) \tag{2.10}$$

Every time the "angle" $2\pi ft$ increases by 2π radians (or 360°), the waveform repeats. Thus another frequency, the *angular frequency*, can be defined. We denote the angular frequency by ω.

$$\omega = 2\pi f \tag{2.11}$$

The dimension of angular frequency is radians/second. A frequency of 1 hertz corresponds to an angular frequency of 2π radians/second.

A quantity related to the peak amplitude, called the *root-mean-square* (*rms*) *amplitude*, is often used to specify the magnitude of a sinusoid. The rms amplitude of a waveform is the square root of the time average value of the square of a waveform. For a sinusoid, the relation between the rms amplitude I_{rms} and the peak amplitude I_p is

$$I_{rms} = \frac{I_p}{\sqrt{2}} \tag{2.12}$$

Thus the sinsusoid of Eq. 2.10 could also be written

$$i = \sqrt{2} I_{rms} \sin (2\pi ft) \tag{2.13}$$

It is conventional when dealing with ac voltages and currents to use the rms instead of the peak amplitude. For example, the voltage on the electric power lines supplying homes and industry is a 60 Hz sinusoidally varying voltage. The amplitude of this voltage is usually written as 115 Vac, which is an equivalent name for 115 volts rms. Thus the *peak amplitude* of the voltage on the 115 Vac power line is $\sqrt{2} \times 115 = 163$ volts.

The waveform of Fig. 2.13c consists of a sequence of positive-going pulses. This kind of waveform is found in digital systems and computers. The